

Sturgeon Chub (*Hybopsis gelida*)

State Rank: S2S3
Global Rank: G3

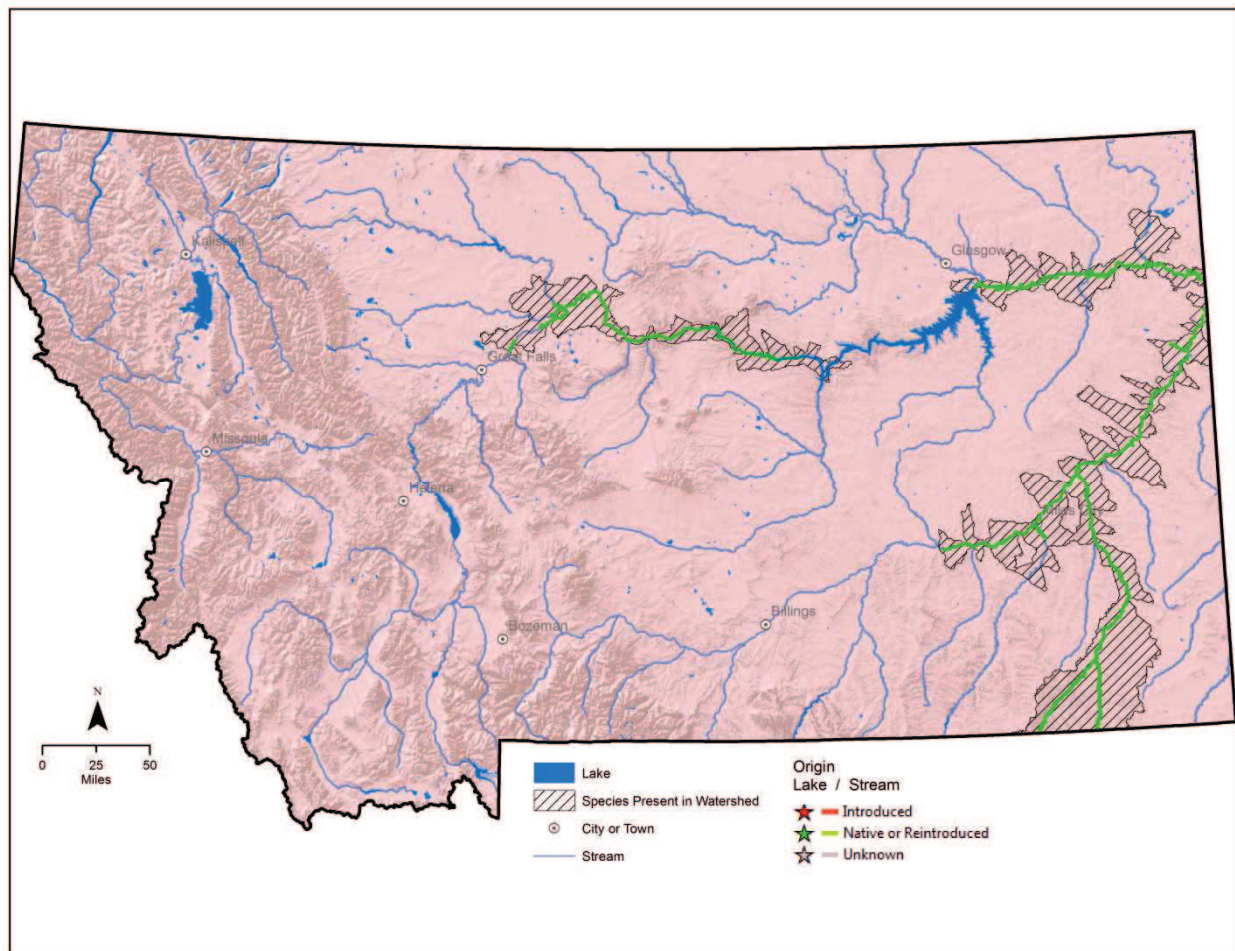


Figure 51. Distribution of sturgeon chub

Habitat

Sturgeon chub are highly adapted to life in turbid waters. Chub are most closely associated with sites having moderate currents and depths and sand or rock substrates (Baxter and Simon 1970; Brown 1976; Lee et al. 1980). In the Powder River, sturgeon chub were taken most frequently at sites with depths less than 20 inches and depth velocities of less than 35.4 inches/second at 23.6 inches in depth (Stewart 1981; Werdon 1992; Gould unpublished data).

Management Plan

Montana Fish, Wildlife & Parks. 2013. Montana Statewide Fisheries Management Plan, 2013-2018. Montana Fish, Wildlife & Parks, Helena, Montana. 478 pp.

Sturgeon Chub Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Channelization of the Missouri River due to irrigation operations and development	Channelization of the Missouri River due to irrigation operations and development	Work with landowners and other agencies to limit activities that may be detrimental to this species
Decreased range and abundance of prey aquatic insect larvae due to dam construction and snag removal	Decreased range and abundance of prey aquatic insect larvae due to dam construction and snag removal	Increased monitoring and survey efforts in eastern Montana designed to monitor population trends and range expansion or loss and collect additional information on life history and ecology
Habitat alteration by dam operations, reducing turbidities and/or altering temperature and flow regimes	Habitat alteration by dam operations, reducing turbidities and/or altering temperature and flow regimes	Restore more natural flow and temperature conditions in the rivers below mainstream and tributary dams.
Low stream flows probably have eliminated some peripheral sturgeon chub populations in smaller streams	Low stream flows probably have eliminated some peripheral sturgeon chub populations in smaller streams	Restore and enhance streamflows to improve habitat for sturgeon chub
Predation by non-native fish	Predation by non-native fish	Determine the effect of non-native fish on sturgeon chub
Removal of wild individuals used for bait fish	Removal of wild individuals used for bait fish	Educate the public on the identification of and importance of native species

Additional Citations

- Baxter, G., and J. Simon. 1970. Wyoming fishers. Bulletin Number 4, Wyoming Game and Fish Department. Cheyenne, Wyoming.
- Brown, C. 1976. Fishes of Montana. Big Sky Books, Montana State University. Bozeman, Montana.
- Lee, S., et al. 1980. Atlas of North American freshwater fishes. North Carolina State Museum of Natural History. Raleigh, North Carolina.
- Stewart, D. 1981. The biology of the sturgeon chub (*Hybopsis gelida girard*) in Wyoming. MS thesis, University of Wyoming, Laramie, Wyoming.
- Weldon, S. 1992. Population status and characteristics of *Macrhybopsis gelida*, *Platygobio gracilis* and *Rhinichthys cataractae* in the Missouri River Basin. MS thesis, South Dakota State University, Brookings, South Dakota.

Trout-perch (*Percopsis omiscomaycus*)
 Species of Greatest Inventory Need

State Rank: S2
 Global Rank: G5

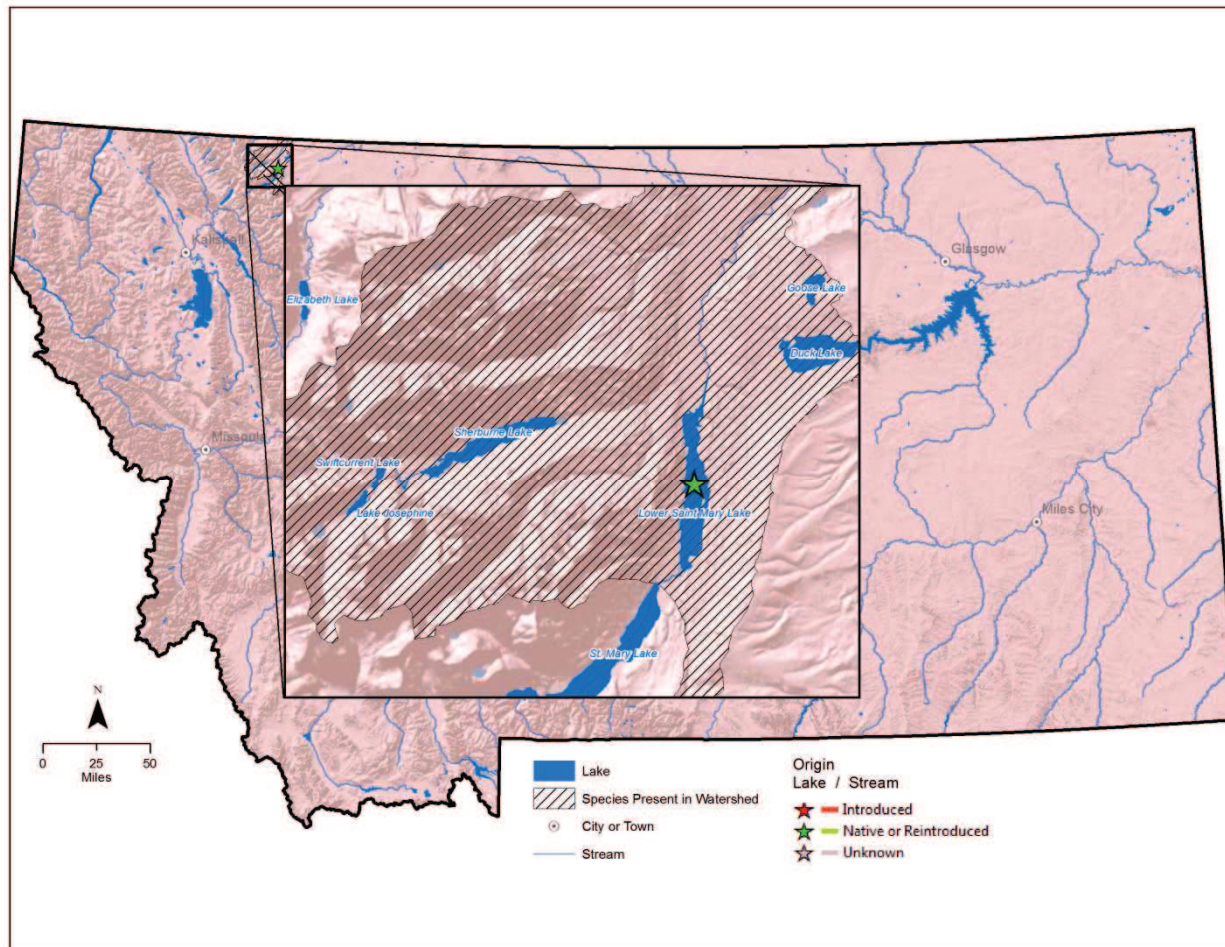


Figure 52. Distribution of the trout-perch

Habitat

Trout-perch preferred habitat is along the shoals of lakes or in deeper pools of streams where the bottom is clean sand, gravel, or rubble. They spawn over sand or gravel in 3-4 feet of water. In the Lower Saint Mary Lake, they are associated with large rocky cover, and are not captured over sandy or silty substrates. During daylight periods, they appear to use rocks as hiding cover, while at night, they are out of, but in close proximity to, rocky cover. In the Saint Mary Canal, trout-perch have been captured in winter after the canal head gate is closed. In the canal, trout-perch are found in residual pools, associated with large, rocky cover or concrete riprap (R. Wagner, USFWS, personal communication, October 2000; AFS website 2013).

Management

FWP classifies trout-perch as a nongame wildlife species. They are too small to be sought by anglers. The entire known range of trout-perch in Montana is within Glacier National Park and the Blackfeet Indian Reservation. Neither entity has a specific management program for trout-perch.

Management Plan

Montana Fish, Wildlife & Parks. 2013. Montana Statewide Fisheries Management Plan, 2013-2018. Montana Fish, Wildlife & Parks, Helena, Montana. 478 pp.

Trout-perch Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Data poor Lacks baseline survey		Surveys in the Belly River and Waterton Lake in Montana are needed to establish the presence of trout-perch in these waters Target species for survey and inventory
Impoundments restricting proper movement of populations	Impoundments restricting proper movement of populations	Manage irrigation and development to improve connectivity of habitat
Sensitive to pollution and sedimentation associated with row crop agriculture, as well as channelization	Sensitive to pollution and sedimentation associated with row crop agriculture, as well as channelization	Conservation of riparian areas, including increased restrictions on fertilizers and nutrients seeping into waters Work with landowners and land management agencies to limit activities that may be detrimental to this species
Sensitive to warm water temperatures	Sensitive to warm water temperatures	Appropriate conservation action(s) unknown
	Climate change	Continue to evaluate current climate science models and recommended actions Maintain connectivity Monitor habitat changes and address climate impacts through adaptive management as necessary Routine monitoring of known populations

Additional Citations

American Fisheries Society, Montana Chapter Website. 2013.
<http://www.fisheriessociety.org/AFSmontana/TroutPerch.html>

Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)*

State Rank: S2
 Global Rank: G4T3

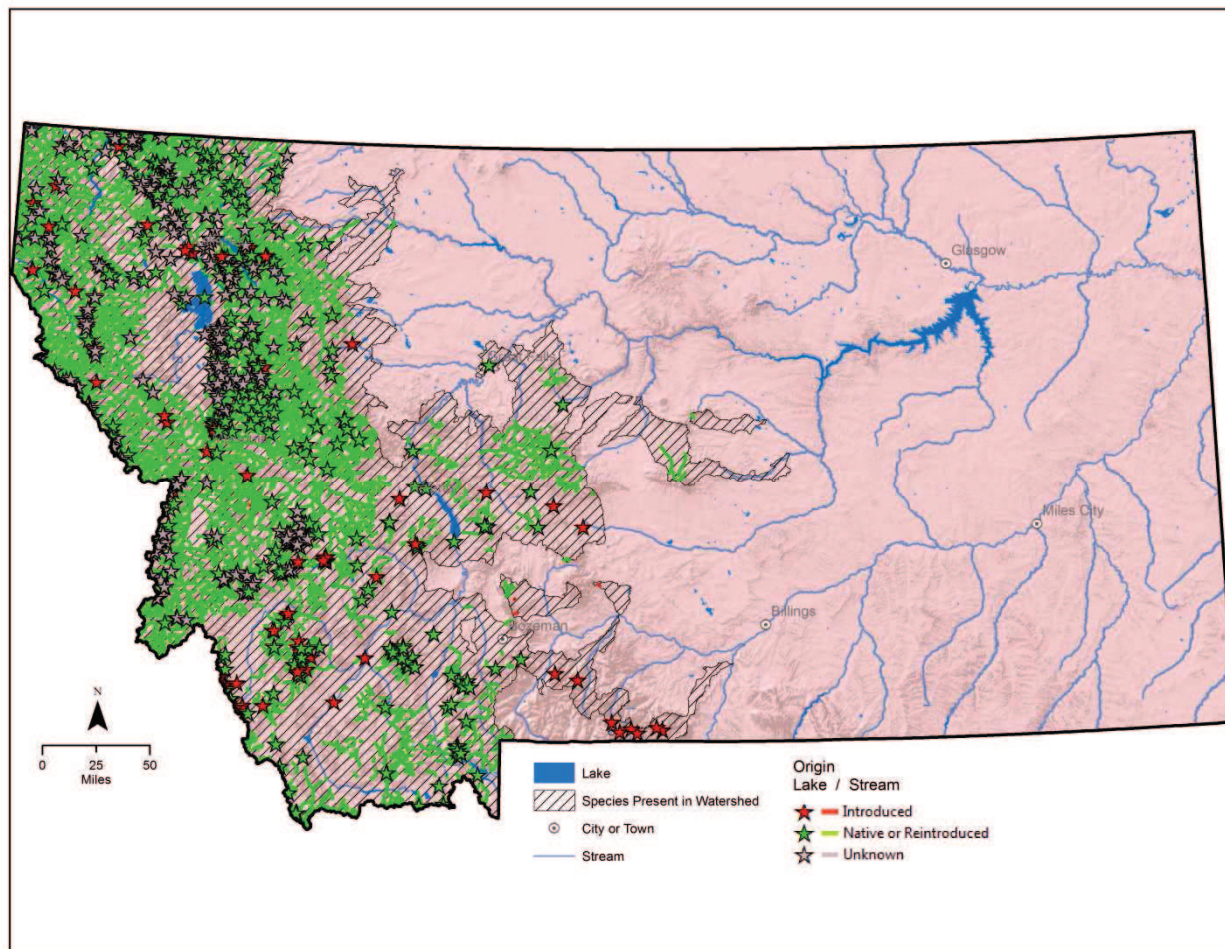


Figure 53. Distribution of westslope cutthroat trout

Habitat

WCT spawning and rearing streams tend to be cold and nutrient poor. This species seeks out gravel substrate in riffles and pool crests for spawning habitat. WCT have long been regarded as sensitive to fine sediment (generally defined as 6.3 millimeters or less). Although studies have documented negative survival as fine sediment increases (Weaver and Fraley 1991), it is difficult to predict their response in the wild (McIntyre and Rieman 1995). This is due to the complexity of stream environments and the ability of fish to adapt somewhat to changes in microhabitat (Everest et al. 1987; AFS website 2013).

WCT require cold water, although it has proven elusive to define exact temperature requirements or tolerances. Likewise, cutthroat trout tend to thrive in streams with more pool habitat and cover than uniform, simple habitat (Shepard et al. 1984). Juvenile WCT overwinter in the interstitial spaces of large stream substrates. Adult WCT need deep, slow-moving pools that do not fill with anchor ice in order to survive the winter (Brown and Mackay 1995; AFS website 2013).

Management

While WCT remain common in many waters west of the continental divide and have been stocked in numerous lakes and reservoirs, their distribution and abundance has declined in many portions of their historic range. Major factors contributing to their decline include competition with non-native species of trout (brook, brown and rainbow trout), hybridization with rainbow trout, stocking outside their historic range, habitat changes, and migratory barriers. In Montana it is currently estimated that genetically pure WCT occupy about 20% (5,950 miles) of their historic range. Slightly hybridized populations (<10% level of hybridization) are also managed for their conservation value and when combined with genetically pure population, the current distribution of WCT increases to 30% (8,830 miles) their historic range.

The status of WCT throughout its distribution in Montana is quite variable. Non-hybridized WCT populations on the west side of the continental divide are more widely distributed and represent the majority of the occupation percentage listed above. Non-hybridized WCT populations in the Upper Missouri River Basin presently only occupy 4% of their historic distribution, and are commonly limited to small headwater streams. As a SGCN and sport fish, WCT receive considerable management attention and resources from FWP, federal land management agencies, and private organizations.

In most cases WCT populations residing in rivers and streams have been identified as “conservation populations,” which indicates the need to manage the population for natural, self-sustaining persistence. Streams and rivers are not stocked with hatchery WCT, with the exception being restoration efforts where cutthroat brood or wild eggs are introduced in smaller streams to reestablish populations. Stream and river creel regulations vary based on strength of populations, with “catch and release” or limited harvest with size limits the most common types of regulation.

Management concerns for WCT vary by drainage and region of the state. Efforts to address threats are often developed specific to an individual body of water. In some waters, angler harvest limits and habitat protection are suitable management measures to ensure robust WCT populations remain. In all locations, biologists are actively monitoring and maintaining or improving habitat conditions necessary for robust cutthroat populations. Such efforts may include addressing concerns related to riparian condition, passage concerns at road crossings, entrainment in irrigation systems, and in-stream flow. In some drainages, non-native trout species are removed to reduce threats to “at-risk” populations, or to develop areas for cutthroat restoration. Barriers to upstream fish passage are often constructed at the lower end of these recovery areas to prevent re-invasion of non-native species. Projects to reestablish WCT populations for conservation purposes are common in the upper Missouri and Yellowstone drainages, and these efforts often include transferring eggs or live fish from existing threatened populations to preserve their genetic legacy.

Management of Montana's WCT is directed by regional and statewide management plans. The 2007 document titled *Memorandum and Conservation Agreement for Westslope Cutthroat trout and Yellowstone Cutthroat Trout in Montana* (FWP 2007) is the principal document that sets objectives and goals for overall cutthroat conservation in Montana, and has been signed by numerous state, federal, tribal, and private stakeholders.

Management Plans

Montana Fish, Wildlife & Parks. 2007. Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat and Yellowstone Cutthroat Trout in Montana. 37 pp.

Montana Fish, Wildlife & Parks. 2013. Montana Statewide Fisheries Management Plan, 2013-2018. Montana Fish, Wildlife & Parks, Helena, Montana. 478 pp.

Shepard, Brad B., B. E. May, W. Urie. 2003. Status of westslope cutthroat trout (*Onchorhynchus clarki lewisi*) in the United States, 2002. Westslope Cutthroat Conservation Team.

Westslope Cutthroat Trout Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Climate change	Climate change	<p>Continue to evaluate current climate science models and recommended actions</p> <p>Habitat restoration</p> <p>Maintain connectivity</p> <p>Monitor habitat changes and address climate impacts through adaptive management as necessary</p> <p>Restore proper width:depth ratio</p> <p>Routine monitoring of known populations</p>
Competition and predation by non-native species	Competition and predation by non-native species	<p>Increase limits of non-native fish</p> <p>Install barriers when necessary and manipulate fish populations to benefit WCT when possible</p> <p>Removal of non-native fish where appropriate and possible</p>
Fish spawning habitat loss due to dewatering of streams for irrigation and because of barriers created by dams and road culverts	Fish spawning habitat loss due to dewatering of streams for irrigation and because of barriers created by dams and road culverts	<p>Remove barriers and improve fish passage</p> <p>Work with landowners and land management agencies to limit activities that may be detrimental to this species</p>

Current Impacts	Future Threats	Conservation Actions
Habitat loss due to range, forest, mining, or agricultural management practices, residential development, and the impact of roads	Habitat loss due to range, forest, mining, or agricultural management practices, residential development, and the impact of roads	<p>Encourage and support opportunities such as land purchases or conservation easements to conserve upland areas adjacent to occupied waters</p> <p>Ensure that species' requirements are included in forest plans</p> <p>Habitat restoration and enhancement</p> <p>Review sub-division requests and make recommendations based on FWP's <i>Fish and Wildlife Recommendations for Subdivision Development</i> (FWP 2012) that reduce the negative effects on SGCN and their habitats</p> <p>Work with landowners and land management agencies to limit activities that may be detrimental to this species</p>
Increased hybridization with other species	Increased hybridization with other species	<p>Assess genetic status of conservation populations</p> <p>Continue to conserve genetically pure populations</p> <p>Creation of barriers to protect remaining populations</p> <p>Protect integrity of pure WCT isolates</p> <p>Restore pure WCT where applicable</p>
Isolated and small population sizes	Isolated and small population sizes	<p>Continue to monitor WCT for trend</p> <p>Continue to monitor WCT populations to adjust stocking when necessary</p> <p>Continue to use the WCT Memorandum of Understanding (Montana Cutthroat Trout Steering Committee 2007) to identify and protect conservation areas</p>

Current Impacts	Future Threats	Conservation Actions
		Identify specific areas where WCT have been extirpated or severely reduced and work toward re-establishment of populations Increase stock populations of genetically pure WCT Reintroduction of WCT
Overfishing	Overfishing	Continue to closely manage WCT harvest Education of WCT identification and distribution

*Only native or reintroduced populations will be addressed.

Additional Citations

American Fisheries Society Montana Chapter website. 2013.
<http://www.fisheriessociety.org/AFSmontana/Westslope.html>

Brown, R. S., and W. C. Mackay. 1995. Fall and Winter Movements of and Habitat Use by Cutthroat Trout in the Ram River, Alberta. Transactions of the American Fisheries Society 124:873–885.

Everest, F. H., R. L. Beschta, J. C. Scrivener, K. V. Koski, J. R. Sedell, and C. J. Cederholm. 1987. Fine Sediment and Salmonid Production: A Paradox. In Streamside Management: Forestry and Fishery Interactions. E. O. Salo and T. W. Cundy, tech. eds. Pp. 98–142. University of Washington, Seattle, Washington.

Leary, R. F., F. W. Allendorf, and N. Kanda. 1998. Lack of Genetic Divergence between Westslope Cutthroat Trout from the Columbia and Missouri River Drainages. Wild Trout and Salmon Genetics Laboratory Report 97/1. Missoula, Montana.

McIntyre, J. D., and B. E. Rieman. 1995. Westslope Cutthroat Trout. Pp. 1–15 in Conservation Assessment for Inland Cutthroat Trout. M. K. Young, tech. ed. General Technical Report RM-256. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Montana Fish, Wildlife & Parks. 2007. Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat and Yellowstone Cutthroat Trout in Montana. 37 pp.

Montana Fish, Wildlife & Parks. 2012. Fish and Wildlife Recommendations for Subdivision Development in Montana: A Working Document. Montana Fish, Wildlife & Parks, Helena, Montana. 174 pp.

- Shepard, B. B., K. L. Pratt, and P. J. Graham. 1984. Life Histories of Westslope Cutthroat Trout and Bull Trout in the Upper Flathead River Basin, Montana. Montana Department of Fish, Wildlife & Parks, Helena, Montana.
- Weaver, T. and J. Fraley. 1991. Fisheries Habitat and Fish Populations. Flathead Basin Forest Practices Water Quality and Fisheries Cooperative Program. Flathead Basin Commission. Kalispell, Montana.

White Sturgeon (Kootenai River Population) (*Acipenser transmontanus*)

State Rank: S1
 Global Rank: G4

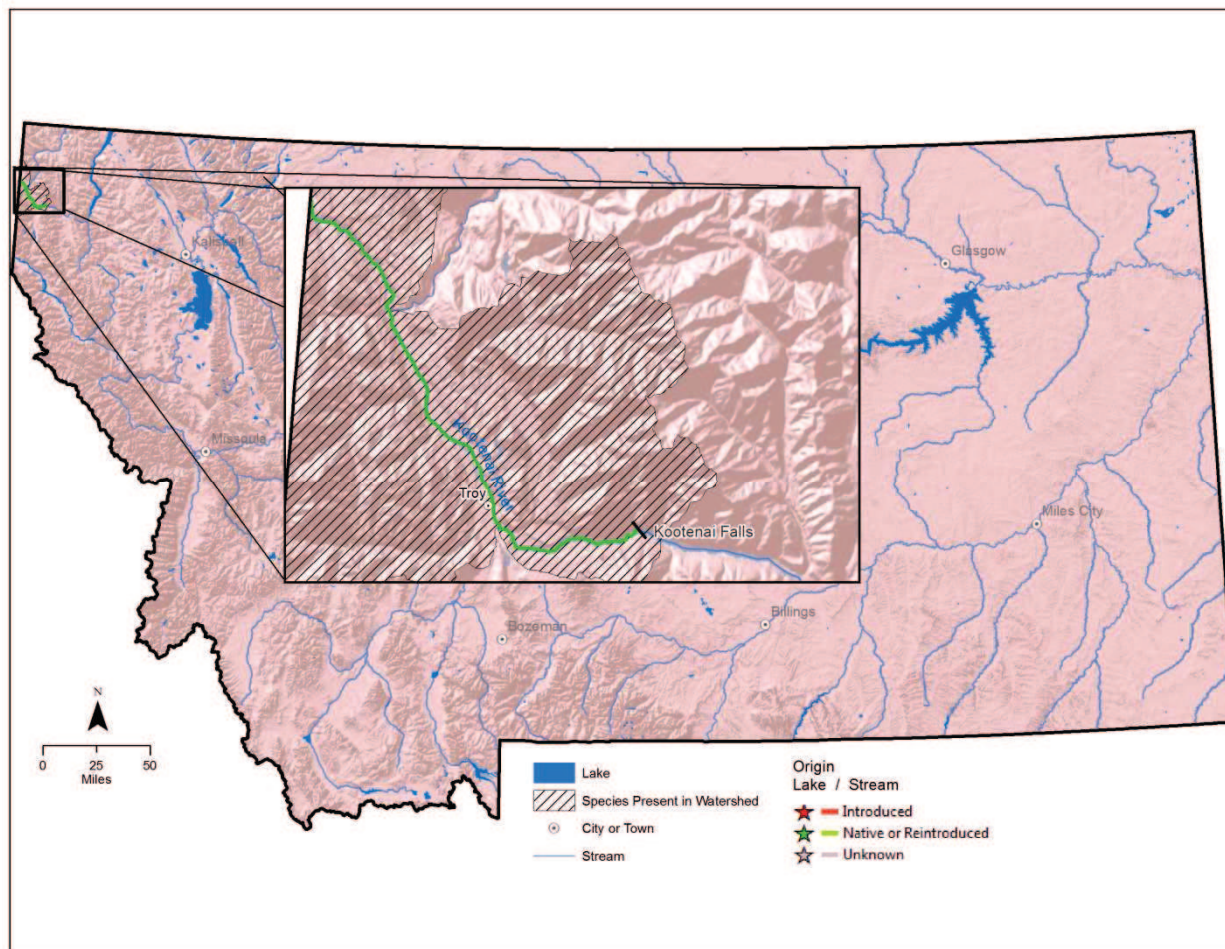


Figure 54. Distribution of white sturgeon

Habitat

The white sturgeon is landlocked in Montana and lives in the large, cool Kootenai River.

Management

Recovery of the white sturgeon population in the Kootenai River is contingent upon reestablishing natural recruitment, minimizing additional loss of genetic variability, and successfully mitigating biological and habitat alterations that continue to harm the population. Refer to the White Sturgeon Recovery Plan (USFWS 1999) for specific details promoting management of white sturgeon. The Kootenai River White Sturgeon Study and Conservation Aquaculture Project was initiated to preserve the genetic variability of the population, begin rebuilding natural age class structure, and prevent extinction while measures are implemented to restore natural recruitment (Anders and Westerhof 1996, USFWS 1999, Ireland 2000, Ireland et al. 2002). A breeding plan has been implemented to guide management in the systematic collection and spawning of wild adults before they are lost from the breeding population (Kincaid 1993). The implementation of the breeding plan includes measures to minimize potential detrimental effects of conventional stocking programs (AFS website 2013).

Management Plan

Montana Fish, Wildlife & Parks. 2013. Montana Statewide Fisheries Management Plan, 2013-2018. Montana Fish, Wildlife & Parks, Helena, Montana. 478 pp.

U.S. Department of the Interior, Fish and Wildlife Service. 1999. White Sturgeon: Kootenai River Population Recovery Plan. Region 1, USFWS, Portland, Oregon.

White Sturgeon Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Recruitment failure: embryo suffocation, predation on early life stages, resource limitations, and possible intermittent female stock limitation	Recruitment failure: embryo suffocation, predation on early life stages, resource limitations, and possible intermittent female stock limitation	Continue the conservation aquaculture program to prevent extinction and preserve genetic variability
Reduced spring flows, unnatural flow fluctuations, and altered thermal regime caused by Libby Dam operation, which may have interrupted spawning behavior and recruitment	Reduced spring flows, unnatural flow fluctuations, and altered thermal regime caused by Libby Dam operation, which may have interrupted spawning behavior and recruitment	<p>Coordinate flow fluctuations in Libby Dam to represent natural flows</p> <p>Restoration of riparian habitats and communities to increase productivity and river function</p> <p>Support restoration efforts of the Kootenai Tribe of Idaho</p>
Limited understanding of species life history in Montana	Limited understanding of species life history in Montana	<p>Continue to enforce an angling ban</p> <p>Continue trend/status monitoring to better understand how this species utilizes portions of the Kootenai River in Montana</p> <p>Participate on and support efforts of the Kootenai River White Sturgeon Recovery Team</p>
	Climate change	<p>Continue to evaluate current climate science models and recommended actions</p> <p>Monitor habitat changes and address climate impacts through adaptive management as necessary</p> <p>Routine monitoring of known populations</p>

Additional Citations

- American Fisheries Society Montana Chapter website. 2013.
<http://www.fisheriessociety.org/AFSmontana/WhiteSturgeon.html>
- Anders, P. J., and R. E. Westerhof. 1996. Conservation aquaculture of endangered white sturgeon (*Acipenser transmontanus*) in the Kootenai River, Idaho. Pp. 51–62 in Proceedings from the International Congress on the Biology of Fishes: Culture and Management of Sturgeon and Paddlefish Symposium Proceedings. San Francisco State University, July 14–18, 1996.
- Ireland, S. C. 2000. Kootenai River White Sturgeon Studies and Conservation Aquaculture. Annual Progress Report. Prepared for U.S. Department of Energy, Bonneville Power Administration. Contract No. 88 BI 93743, Project No. 88-64. Portland, Oregon.
- Ireland, S. C., P. J. Anders, and J. T. Siple. 2002. Conservation aquaculture: An adaptive approach to prevent extinction of an endangered white sturgeon population (*Acipenser transmontanus*). Pages 211-222 In: W. VanWinkle, P. Anders, D. Dixon, and D. Secor, eds. Biology, Management and Protection of North American Sturgeons. American Fisheries Society Symposium 28.
- Kincaid, M. L. 1993. A breeding plan to preserve the genetic variability of the Kootenai River white sturgeon. Contract No. DE-AI79-93BP02886. Bonneville Power Administration, Portland, Oregon.
- U.S. Department of the Interior, Fish and Wildlife Service. 1999. White Sturgeon: Kootenai River Population Recovery Plan. Region 1, USFWS, Portland, Oregon.

Yellowstone Cutthroat Trout (*Oncorhynchus clarki bouvieri*)*

State Rank: S2
Global Rank: G4T2

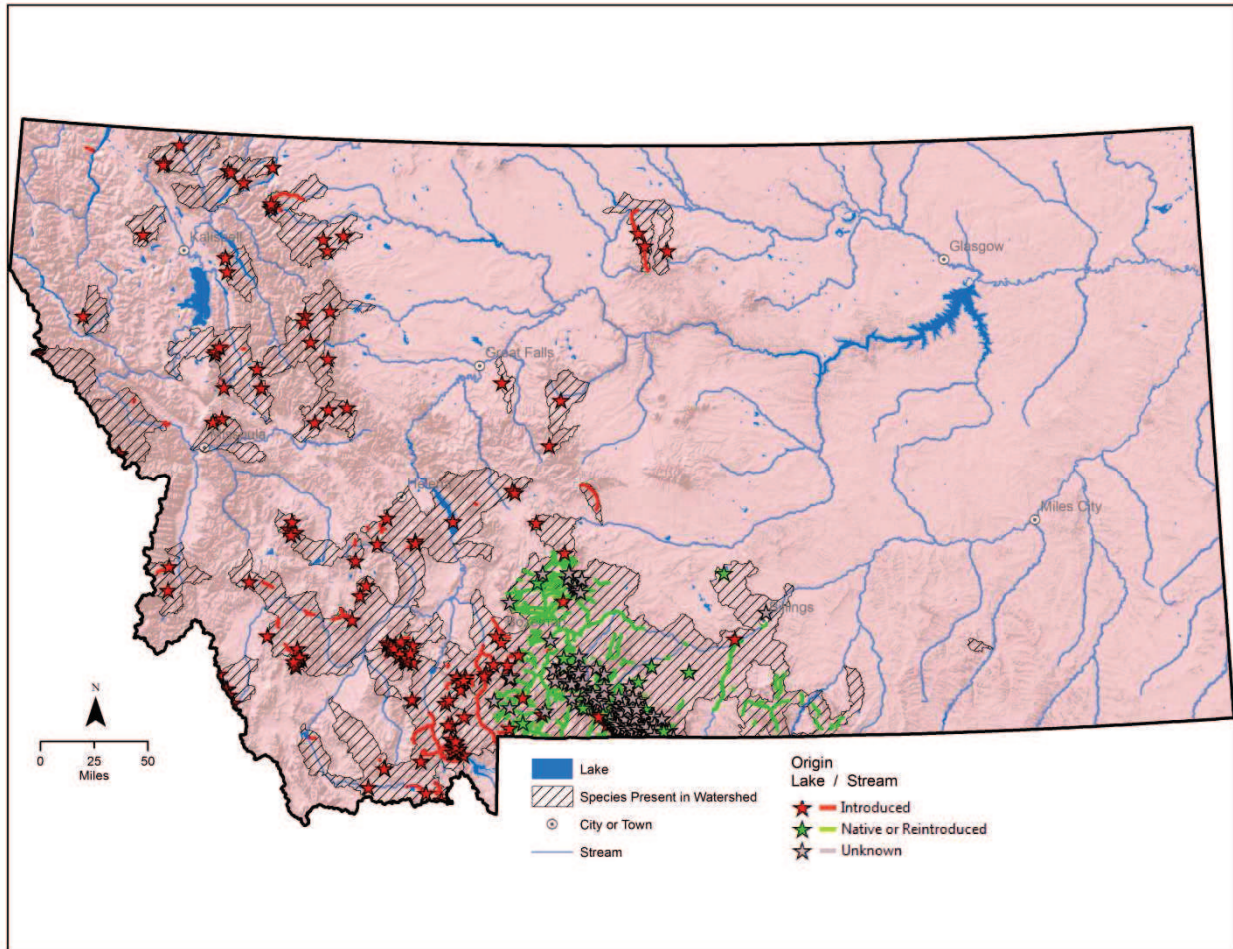


Figure 55. Distribution of Yellowstone cutthroat trout

Habitat

YCT inhabit relatively clear, cold streams, rivers, and lakes. Optimal temperatures have been reported to be from 39 to 59 degrees F., with occupied waters ranging from 32 to 81 degrees F (Gresswell 1995; AFS website 2013).

Management

While YCT remain common in many waters west of the continental divide and have been stocked in numerous lakes and reservoirs, their distribution and abundance has declined in many portions of their historic range. Major factors contributing to the sub-species' decline include competition with non-native species of trout (brook, brown and rainbow trout), hybridization with rainbow trout, stocking outside their historic range, habitat changes and migratory barriers. In Montana it is currently estimated that genetically pure YCT occupy about 16% (705 miles) of their historic range. Slightly hybridized populations (<10% level of hybridization) are also managed for their conservation value and when combined with genetically pure population, the current distribution of YCT increases to and 28% (1,210 miles) of their historic ranges.

YCT status and distribution varies spatially. Some areas exist where YCT have been isolated from non-native fishes, but many of the existing YCT populations overlap with non-native species and are therefore not secure. Non-hybridized YCT populations in the Upper Yellowstone River Basin presently occupy 26% of their historic distribution. As a SGCN and sport fish, YCT receive considerable management attention and resources from FWP, federal land management agencies, and private organizations.

In most cases YCT populations residing in rivers and streams have been identified as “conservation populations,” which indicates the need to manage the population for natural, self-sustaining persistence. Streams and rivers are not stocked with hatchery YCT, with the exception being restoration efforts where cutthroat brood or wild eggs are introduced in smaller streams to reestablish populations. Stream and river creel regulations vary based on strength of populations, with “catch and release” or limited harvest with size limits the most common types of regulation.

Management concerns for YCT vary by drainage and region of the state. Efforts to address threats are often developed specific to an individual body of water. In some waters, angler harvest limits and habitat protection are suitable management measures to ensure robust YCT populations remain. In all locations, biologists are actively monitoring and maintaining or improving habitat conditions necessary for robust cutthroat populations. Such efforts may include addressing concerns related to riparian condition, passage concerns at road crossings, entrainment in irrigation systems, and in-stream flow. In some drainages, non-native trout species are removed to reduce threats to “at-risk” populations, or to develop areas for cutthroat restoration. Barriers to upstream fish passage are often constructed at the lower end of these recovery areas to prevent re-invasion of non-native species. Projects to reestablish YCT populations for conservation purposes are common in the upper Missouri and Yellowstone drainages, and these efforts often include transferring eggs or live fish from existing threatened populations to preserve their genetic legacy.

Management of YCT is directed by regional and statewide management plans. The 2007 document titled *Memorandum and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana* (FWP 2007) is the principal document that sets objectives and goals for overall cutthroat conservation in Montana, and has been signed by numerous state, federal, tribal, and private stakeholders.

Management Plans

Endicott, C., S. Opitz, B. Shepard, P. Byorth, S. Shuler, S. Barndt, B. Roberts, and L. Roulson. 2012. Yellowstone cutthroat trout conservation strategy for the Shields River watershed above Chadbourne Diversion. 141 pp. <http://fwp.mt.gov/fishAndWildlife/management/yellowstoneCT/>

Montana Department of Fish, Wildlife & Parks. 2000. Cooperative Conservation Agreement for Yellowstone Cutthroat Trout within Montana between Crow Tribe, Montana Department of Fish, Wildlife & Parks, Montana Department of Environmental Quality, Montana Department of Natural Resources and Conservation, USDA Forest Service–Northern Region, Gallatin and Custer national forests, Bureau of Land Management–Montana, US Fish and Wildlife Service, Bureau of Indian Affairs, Yellowstone National Park.

Montana Fish, Wildlife & Parks. 2007. Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat and Yellowstone Cutthroat Trout in Montana. 37 pp.

Montana Fish, Wildlife & Parks. 2013. Montana Statewide Fisheries Management Plan, 2013-2018. Montana Fish, Wildlife & Parks, Helena, Montana. 478 pp.

Montana Fish, Wildlife and Parks. 2013. Yellowstone Cutthroat Trout Conservation Strategy for Montana. <http://fwp.mt.gov/fishAndWildlife/management/yellowstoneCT/>

Range-Wide Yellowstone Cutthroat Trout Conservation Team. 2009. Conservation Strategy for Yellowstone Cutthroat Trout (*Oncorhynchus clarkii bouvieri*) in the States of Idaho, Montana, Nevada, Utah and Wyoming. Montana Fish, Wildlife and Parks, Helena.

Yellowstone Cutthroat Trout Working Group. 1994. Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) management guide for the Yellowstone River drainage. Montana Department of Fish, Wildlife & Parks, Helena, Montana, and Wyoming Game and Fish Department, Cheyenne, Wyoming.

Yellowstone Cutthroat Trout Current Impacts, Future Threats, and Conservation Actions

Current Impacts	Future Threats	Conservation Actions
Climate change	Climate change	Continue to evaluate current climate science models and recommended actions Habitat restoration Maintain connectivity Monitor habitat changes and address climate impacts through adaptive management as necessary Routine monitoring of known populations
Culverts, dams, irrigation diversions, and other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat	Culverts, dams, irrigation diversions, and other instream barriers that fully or partially impede fish movement and reduce connectivity of habitat	Removal or modification of barriers to restore beneficial fish passage
Habitat degradation	Habitat degradation	Habitat restoration and enhancement

Current Impacts	Future Threats	Conservation Actions
Persistence of non-native fish	Persistence of non-native fish	Continue harvest management of non-native trout Reduce or eliminate stocking of non-native fish
Poor range, forest, development, or mining management practices	Poor range, forest, development, or mining management practices	Encourage and support opportunities such as land purchases or conservation easements to conserve upland areas adjacent to occupied waters Ensure that species' requirements are included in forest plans Habitat restoration and enhancement Review sub-division requests and make recommendations based on FWP's <i>Fish and Wildlife Recommendations for Subdivision Development</i> (FWP 2012) that reduce the negative effects on SGCN and their habitats Work with landowners and land management agencies to limit activities that may be detrimental to this species
River channelization or riprap	River channelization or riprap	Work with new stabilization projects to reduce impacts and support efforts to restore existing rip-rap areas to natural condition
Susceptibility to infection by <i>Myxobolus cerebralis</i> , a European protozoan and the causative agent of whirling disease	Susceptibility to infection by <i>Myxobolus cerebralis</i> , a European protozoan and the causative agent of whirling disease	Work with partners to provide or obtain funding to study whirling disease
Tributary dewatering by unsustainable irrigation practices	Tributary dewatering by unsustainable irrigation practices	Work with landowners and land management agencies to limit activities that may be detrimental to this species

Current Impacts	Future Threats	Conservation Actions
Widespread stocking of non-indigenous populations of YCT	Widespread stocking of non-indigenous populations of YCT	<p>Decrease stocking of non-indigenous YCT to decrease genetic homogenization</p> <p>Decrease stocking of non-native trout</p> <p>Follow recommendations in the Yellowstone Cutthroat Trout Conservation Strategy for Montana (FWP 2013), specifically for monitoring for genetic diversity and population change (page 183,184)</p>

*Only native or reintroduced populations will be addressed.

Additional Citations

American Fisheries Society Montana Chapter website. 2013.
<http://www.fisheriessociety.org/AFSmontana/Yellowstone.html>

Gresswell, R. E. 1995. Yellowstone cutthroat trout. Pp. 36–54 in M. K. Young, tech. ed. Conservation assessment for inland cutthroat trout. USDA Forest Service General Technical Report RM-GTR-256.

Montana Fish, Wildlife & Parks. 2007. Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat and Yellowstone Cutthroat Trout in Montana. 37 pp.

Montana Fish, Wildlife & Parks. 2012. Fish and Wildlife Recommendations for Subdivision Development in Montana: A Working Document. Montana Fish, Wildlife & Parks, Helena, Montana. 174 pp.

Montana Fish, Wildlife and Parks. 2013. Yellowstone Cutthroat Trout Conservation Strategy for Montana. <http://fwp.mt.gov/fishAndWildlife/management/yellowstoneCT/>